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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
COUGHLAN, PETER D	
ART UNIT	**PAPER NUMBER**
2129	

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,355	LLINAS ET AL.	
	Examiner	Art Unit	
	Peter Coughlan	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/27/04 & 3/18/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. Claims 1-11 are pending in this application.

Drawings

2. There are numerous defects with the drawings and the specification. One example is in drawing 10 and associated paragraph [0088]. In Paragraph [0088] the line 'Inputs are included to control the amplitude of signals generated by the first spike generator 23', and 'a filter, 23'. So is item 23 'a filter' or a 'first spike generator'?

This ambitious error and all other errors must be corrected with amended claims or specification or withdrawal of the claims entirely.

35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-11 are rejected under 35 U.S.C. 101 for nonstatutory subject matter. The computer system must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application. The connection between different components with different properties without a practical real world application are not statuary. The result has to be a practical application. Please see the interim guidelines for examination of patent applications for patent subject matter eligibility published November 22, 2005 in the official gazette.

In addition, claims 1-4 pertain to a carrier signal which is not statutory. Under 2106.01 [R-5] Computer-Related Nonstatutory Subject Matter, in the MPEP.

> 'When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8'
>
> In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101.

The combination of a 'ca-spike', 'sin-generator', 'filter' and 'spike generator' does not have a practical application. The generation of an oscillation containing amplitude and frequency along with employing two thresholds has no defined real world purpose.

The invention must be for a practical application and either:

1) specify transforming (physical thing) or

2) have the FINAL RESULT (not the steps) achieve or produce a

useful (specific, substantial, AND credible),

concrete (substantially repeatable/ non-unpredictable), AND

tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

The generation of an oscillation containing amplitude and frequency along with employing two thresholds has no defined real world purpose. The combination of a 'ca-spike', 'sin-generator', 'filter' and 'spike generator' does not have a practical application.

Claims that pertain to a carrier signal are not statuary.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Pointing out which spike generation is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Claim 2 states preserving a phase of the oscillation following the spike generation of claim 1. The problem arises that in claim 1, there are two different spikes that are generated.

This claim and/or specification needs to be amended or the claim needs to be withdrawn.

Claim11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claim which states 'the degree of coupling between processing units within the at least one cluster is greater than the degree of coupling between said processing units within the at least one cluster and other processing units' is not explained not this is accomplished within the specification. There is no algorithm or method which teaches how this is accomplished.

This claim and/or specification needs to be amended or the claim needs to be withdrawn.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 states preserving a phase of the oscillation following spike generation. Does this mean the 'phase of the oscillation' is 'preserved' at some location before the threshold or does this mean the 'phase of the oscillation' is outputted with the result thus 'preserving the phase of the oscillation'?

This claim and/or specification needs to be amended or the claim needs to be withdrawn.

The term "cluster" in claims 10 and 11 is a relative term which renders the claim indefinite. The term "cluster" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. How many are in a cluster?

These claims and/or specification needs to be amended or the claims need to be withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-8, 10, 11 are rejected under 35 U.S.C. 102(b) (hereinafter referred to as **Maass**) being anticipated by Maass, 'Pulsed Neural Networks'.

Claim 1

Maass anticipates generating an oscillation (**Maass,** p88:32 through p89:10; 'Generating an oscillation' of applicant is equivalent to 'pulse encoding' of Maass.)having an amplitude (**Maass,** p90:8-15) and a frequency (**Maass,** p91:9-22); generating a first spike when the oscillation exceeds a first threshold; and generating a second spike when the oscillation exceeds a second threshold. (**Maass,** p76, figure 2.12; Maass illustrates a 2 layer neural network. Each neuron in each layer has a 'threshold', therefore whatever the output of the neural network in figure 2.12, it would have to pass through 2 thresholds.)

Claim 2

Maass anticipates preserving a phase of the oscillation following spike generation. (**Maass,** p59:6-16; 'Preserving a phase of the oscillation' of applicant is illustrated by the addition of a 'background oscillation' of Maass.)

Claim 3

Maass anticipates wherein the first and second thresholds are functions of external stimuli. (**Maass,** p62:20 through p63:20; 'External stimuli' of applicant is equivalent to 'external sensory input variables' of Maass.)

Claim 5

Maass anticipates an oscillation generator generating an oscillation (**Maass,** p88:32 through p89:10; 'Oscillation generator' of applicant is equivalent to 'pulse encoding' of Maass.)having an amplitude (**Maass,** p90:8-15) and a frequency (**Maass,** p91:9-22); a first spike generator generating a first spike when the oscillation exceeds a first threshold; and a second spike generator generating a second spike when the oscillation exceeds a second threshold. (**Maass,** p76, figure 2.12; Maass illustrates a 2 layer neural network. Each neuron in each layer has a 'threshold', therefore whatever the output of the neural network in figure 2.12, it would have to pass through 2 thresholds.)

Claim 6

Maass anticipates a plurality of processing units, each processing unit being in accordance with claim 5. (**Maass,** p76, figure 2.12; Part 'C' of this figure illustrates a plurality of 'processing units' of applicant.)

Claim 7

Maass anticipates a plurality of coupling elements, each coupling element coupling a pair of processing units and providing a variable degree of coupling based on an output of at least one of the pair of processing units. (**Maass,** p76; figure 2.12; Each coupling element of applicant is the connection between each neuron on Maass. In section 'C' of figure illustrates the connections between the first and second processing units of applicant. 'Variable degree of coupling' of applicant is illustrated in section 'A' of Maass. Maass illustrates the summation of various inputs of the processing module which is equivalent to the 'variable degree' of applicant.)

Claim 8

Maass anticipates a first processing unit, the first processing unit mimicking an inferior olive neuron; a second processing unit, the second processing unit mimicking an inferior olive neuron; and a coupling element coupling the first and second processing units, the coupling element providing a variable degree of coupling based on an output of at least one of the first and second processing units. (**Maass,** p76, figure 2.12; Each neuron in layer 1 of Maass is equivalent to the 'first processing unit' of applicant. Each neuron in layer 2 of Maass is equivalent to 'a second processing unit of applicant. In

section 'C' of figure illustrates the connections between the first and second processing units of applicant. 'Variable degree of coupling' of applicant is illustrated in section 'A' of Maass. Maass illustrates the summation of various inputs of the processing module which is equivalent to the 'variable degree' of applicant.)

Claim 10

Maass anticipates a plurality of processing units, each of the processing units mimicking an inferior olive neuron; and a plurality of coupling elements coupling adjacent processing units, each of the coupling elements providing a variable degree of coupling based on an output of at least one of the plurality of processing units (**Maass,** p76, figure 2.12; Each neuron in both layers of Maass is equivalent to 'processing units' of applicant. In section 'C' of figure illustrates the coupling between the first and second processing units of applicant. 'Variable degree of coupling' of applicant is illustrated in section 'A' of Maass. Maass illustrates the summation of various inputs of the processing module which is equivalent to the 'variable degree' of applicant.), wherein the plurality of processing units includes at least one cluster of processing units having substantially synchronized activity. (**Maass,** p59:6-16; 'Substantially synchronized activity' of applicant is equivalent to 'near-synchronization of firing' of Maass.)

Claim 11

Maass anticipates wherein the degree of coupling between processing units within the at least one cluster is greater than the degree of coupling between said

processing units within the at least one cluster and other processing units. (**Maass,** p66:21-23; 'The degree of coupling between processing units within the at least one cluster is greater than the degree of coupling between said processing units within the at least one cluster and other processing units' of applicant is accomplished by the 'function sat' of Maass.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maass as set forth above in view of Maas ('Model-Based Control for Ultrasonic Motors', referred to as **Maas**)

Claim 4

Maass does not teach wherein an output device is controlled in accordance with a phase of the oscillation.

Maas teaches wherein an output device is controlled in accordance with a phase of the oscillation. (**Maas,** abstract, p166, C1:7-32; 'Output device' of applicant is equivalent to 'ultrasonic motors' of Maas.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Maass by using phase as a method of control as taught by Maas to have an output device is controlled in accordance with a phase of the oscillation.

For the purpose of control thereby enabling the system to implement an action when it is required.

Claim 9

Maass does not teach a control system in accordance with claim 8.

Maas teaches a control system in accordance with claim 8. (**Maas,** abstract, p166, C1:7-32 ; 'Control system' of applicant is equivalent to controlling the 'independent adjustment of voltage amplitudes and phases' of Maas.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Maass by having the ability to control as taught by Maas to have control system in accordance with claim 8.

For the purpose of control thereby enabling the system to implement an action when it is required.

Conclusion

4. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure.

-U. S. Patent 5339177: Jenkins

-U. S. Patent 5921940: Verrier

-U. S. Patent 5507485: Fisher

-U. S. Patent Publication 20020051579: Dugue

-U. S. Patent Publication 20020038186: Henry

-U. S. Patent Publication 20020019710: Henry

-U. S. Patent 5940529: Buckel

-U. S. Patent 6358706: Dubin

-U. S. Patent 6169981: Werbos

-U. S. Patent 5136687: Edelman

-'Frequency glides in the impulse responses of auditory nerve fibers: Implications for binaural neurons': Carney

-'The microcircuit associative memory: A biologically motivated memory architecture': Miles

5. Claims 1-11 are rejected.

Correspondence Information

6. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor David Vincent can be reached at (571) 272-3687. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

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Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.)

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Peter Coughlan

12/4/2006

12/1/06
DAVID VINCENT
SUPERVISORY PATENT EXAMINER